

## 500 - Airport Planning

Airport planning is a systematic process utilized to establish guidelines for the efficient development of airports that is consistent with local, state and national goals. A key objective of airport planning is to assure the effective use of airport resources in order to satisfy aviation demand in a financially feasible manner.

Airport planning may be as broad based as the national system plan or more centrally focused as an airport master plan for an specific airport. The primary types of airport planning may basically be classified as follows:

- National System Planning (NPIAS)
- State Airport System Planning (SASP)
- Metropolitan Airport System Planning
- Airport Master Planning

For an individual airport, the owners more closely identify with the airport master plan for their airport. An airport master plan represents the airport's blueprint for long-term development. A few of the goals of a master plan are:

- To provide a graphic representation of existing airport features, future airport development and anticipated land use.
- To establish a realistic schedule for implementation of the proposed development
- To identify an realistic financial plan to support the development
- To validate the plan technically and procedurally through investigation of concepts and alternatives on technical, economic and environmental grounds.
- To prepare and present a plan to the public that adequately addresses all relevant issues and satisfies local, state and federal regulations.
- To establish a framework for a continuous planning process.

The acceptance of an airport master plan by the FAA must not be construed as an approval of the entire master plan document. The FAA only approves components of a master plan, not the entire document. The key elements that the FAA reviews and formally approves are:

- Forecasts
- Selection of critical aircraft
- Airport layout plan (ALP)

It is from these elements that a determination is made regarding eligibility of AIP funding for proposed development. It is critical that airport owners and their consultant coordinate early and often with the appropriate FAA planner to identify significant planning issues and to determine the type and magnitude of effort required to address such issues.

**RESOURCES****Advisory Circulars**

- [Planning Advisory Circulars](#)
- [AC 150/5070-6](#) - Master Plans
- [AC 150/5300-13](#) - Airport Design

**Guidance**

- [Aviation Forecasts](#): Terminal Area Forecast, Long Range Forecast
- [Passenger & Cargo Data](#)
- [Aeronautical Survey](#): PACS & SACS, Aeronautical surveys

## 510 - National Plan of Integrated Airport Systems (NPIAS)

Before an airport can be considered eligible to receive Federal funds, it must be included in the National Plan of Integrated Airport Systems (NPIAS). The NPIAS, as required by Section 47103 of Title 49 of United States Code (USC), is a Federal Aviation Administration's (FAA) document that provides short (1-5 year) and long (6-10 year) cost estimates of AIP eligible projects associated with establishing a system of airports adequate to meet the needs of the National Airspace System (NAS).

The NPIAS provides an inventory of airport development for Airport Capital Improvement Plan (ACIP) purposes. The ACIP is formulated based on the airport development needs identified by the NPIAS and is best understood as a subset of the NPIAS, highlighting airport needs over a 3-year funding cycle.

An airport's inclusion in the NPIAS is based on information provided by a potential airport sponsor to the FAA Regional Airports Division. The Airports Division will evaluate an airport's inclusion into the NPIAS based on:

- Whether an airport is considered a public-use airport.
- The number of enplanements the airport has or is forecast to have.
- The number of based aircraft located at the airport.
- Whether an airport receives U.S. Mail service.
- Whether there is a component of the U.S. Military, Reserves or National Guard permanently based on or adjacent to the airport.
- Special justification that would consider the isolation of the community being served, whether the airport serves the need of an Indian tribe, supports recreation areas, or is needed to develop or protect important national resources.

The FAA enters airports into the NPIAS in accordance with criteria contained in FAA Order 5090.3C, Field Formulation of the National Plan of Integrated Airport Systems (NPIAS), dated September 25, 2000. The NPIAS includes airport development recommended in FAA accepted airport master and system plans or shown on FAA approved airport layout plans. It may also include airport development identified from FAA airport site visits and contained in airport owners' capital improvement programs.

The listing of any location, airport or item of development in the NPIAS does not in any way legally obligate or commit the Federal government to provide funds for specific development. It also does not imply environmental approval of the proposed development.

### RESOURCES

#### Reports

- [NPIAS Report](#)

## 520 - Airport Layout Plans

### Overview

The Airport Layout Plan (ALP) serves as a critical planning tool that depicts both existing facilities and planned development for an airport. All airport development carried out at federally obligated airports must be accomplished in accordance with an FAA-approved ALP.

By definition, the ALP is a plan for an airport showing boundaries and proposed additions to all areas owned or controlled by the sponsor for airport purposes, the location and nature of existing and proposed airport facilities and structures, and the location on the airport of existing and proposed non-aviation areas and improvements thereon.

### AIP Funding

A current FAA approved ALP is a prerequisite for issuance of a grant for airport development. Any sponsor who has received a grant for airport development is obligated by an assurance in the grant to “keep the ALP up-to-date at all times.”

### Keeping ALP Current

ALP's become “out-of-date” when they do not adequately provide for future needs, conform with current airport design standards, accurately reflect existing features, or reflect airport and critical land use changes which may affect the navigable airspace or the ability of the airport to expand. An ALP that has not been “updated” for several years is usually deficient in all four respects. When the FAA advises that an ALP needs to be “updated” it simply means that the plan for airport development needs to be reviewed for currency in all areas and changed as necessary. In actual practice, the updating may be accomplished by revising the original reproducible drawings, Computer Aided Graphics (CAD) file, or by preparing an all-new set of drawings. The decision of which method to use lies with the sponsor. A consulting firm with airport planning experience can normally be relied upon for proper counsel in this regard, but if in doubt, sponsors may also contact FAA for advice. The updated ALP needs FAA approval prior to the issuance of the grant for an airport development project.

It is also important to realize that the physical completion of an airport development project will normally trigger the need to update the ALP for the purpose of reflecting work accomplished under the grant. Therefore, many projects will require an ALP update both before grant issuance and after project completion.

### AIP Eligibility

The cost of environmental studies and updating the ALP is an eligible project formulation cost under the AIP. ALP updates and revisions are no longer included within development grants. We require that airport sponsors fund smaller (less than \$25,000) environmental studies and ALP updates with their own funds and seek reimbursement from the Federal Aviation Administration (FAA) if, and at such time as, the FAA provides a development grant connected with the prior project formulation work that has occurred. To ensure that funds are available for reimbursement of the environmental studies and ALP updates, sponsors should include the costs in their preapplication. Also, the engineering contract for the development in the project, should include provisions for the ALP update or it can be accomplished under a separate contract.

### Guidance for Preparing ALPs

The FAA Central Region has developed an ALP checklist for airport owners to use as an aide in preparing and updating ALPs. Questions regarding the preparation and submittal of an ALP set for approval should be addressed to the Central Region airport planner ([Central Region Roster](#)) responsible for your state. For GA and Non-primary airports within the state of Missouri, please contact the Missouri Department of Transportation at (573) 526-5571.

## RESOURCES

### Advisory Circular

- [AC 150/5070-6](#) - Master Plans
- [AC 150/5300-13](#) - Airport Design
- [ALP Checklist](#) (doc): Steps to preparing an ALP

## 530 - Environmental Review

Airport planning and development projects that include Federal involvement must be subject to an environmental review. The FAA is bound by statutory and regulatory requirements to evaluate the environmental consequences of all proposed developments shown on the approved airport layout plan.

Applicable regulations include but are not limited to the National Environmental Policy Act (NEPA), Clean Air Act, Airport and Airway Improvement Act.

The FAA must carefully analyze and evaluate the impact that a proposed development presents to the environment. This involves a systematic and multidisciplinary approach that verifies compliance with the requirements of NEPA.

[FAA Order 1050.1](#) (.pdf) Environmental Impacts: Policies and Procedures, establishes FAA policy and procedures for implementing NEPA. [FAA Order 5050.4](#) Airport Environmental Handbook provides guidance and instruction on meeting the requirements of NEPA and FAA Order 1050.1E.

### **AIP project funding and programming may not proceed ahead of the environmental review and FAA concurrence.**

As the proponent, the airport owner is responsible for identifying all environmental issues associated with the proposed development. The airport owner must also develop conceptual alternatives for consideration. The airport owner typically accomplishes this environmental review by preparing an environmental assessment (EA).

Since some projects have proven to have no significant impact to the environment, such specific projects may be categorically excluded from extensive environmental review. Sponsors should consult with the FAA early in the planning process to determine the criteria and limits required of their environmental review.

The FAA is responsible for independently analyzing and evaluating the environmental consequences identified in the sponsor's environmental assessment. After verifying the adequacy and sufficiency of the environmental assessment, the FAA will issue either a Finding of No Significant Impact (FONSI) or an Environmental Impact Statement (EIS). The FAA formally documents the determination by issuing a Record of Decision (ROD).

The AIP programming and funding process may commence once a favorable determination is established.

## RESOURCES

### **Guidance**

- [National Environmental Guidance](#)
- [Central Region Environmental Guidance](#)

### **Records of Decision (ROD)**

- [Lambert-St. Louis](#) - Record of Decision for the W-1W improvements at Lambert-St. Louis. ROD is dated 9/30/98
- [Records of Decisions](#) - National listing of Record of Decisions

## 531 - Categorical Exclusions

### Overview

An airport sponsor considering a proposed project must know what environmental documentation may need to be provided to the FAA to satisfy requirements of the National Environmental Policy Act (NEPA).

Some projects may qualify for a categorical exclusion (CE), which means the airport does not need to prepare a formal Environmental Assessment (EA) or other environmental documentation. As an example, the acquisition of security equipment (required by 14 CFR Part 107), safety equipment (required by 14 CFR Part 139) or snow removal equipment would clearly be categorically excluded and thus it is not necessary for the sponsor to provide any environmental documentation.

Other proposed projects, as listed in Chapter 6 of FAA Order 5050.4, may be excluded if no impacts to the environment occur as a result of the project. To aid the FAA in making its determination as to whether a categorical exclusion or an environmental assessment is appropriate for a proposed project, we request that a sponsor fill out a Categorical Exclusion Checklist, and, if appropriate, contact other agencies for relevant information. The information that the airport provides to FAA in the categorical exclusion checklist can be a significant time-savings for the airport sponsor if it demonstrates that an Environmental Assessment is not required.

In general, the following procedures should be followed for the proposed projects listed in FAA Order 5050.4 Chapter 6, particularly if the proposal would result in land acquisition or earthwork disturbances (taxiway, apron expansions, grading, etc.).

To ensure that the proposed project will not violate the requirements of NEPA, the Endangered Species Act, the Historic Preservation Act, or Section 404 of the Clean Water Act, the sponsor should normally solicit comments from at least the agencies listed below, and attach that correspondence to the checklist. However, if the airport is confident that it has evidence to clearly demonstrate no impacts to the above three resources (for example, correspondence from a previously completed EA or wetlands determination), and that contact with the agency of jurisdiction is not necessary, it should contact the FAA to receive its approval to include the airport's documentation in the checklist instead of the agency letters.

1. U.S. DOI Fish and Wildlife Service, and appropriate State wildlife agency (for comment on possibility of impacting threatened and endangered species)
2. Corps of Engineers (jurisdictional wetlands) and/or US Department of Agriculture (possible wetlands in or adjacent to areas being farmed)
3. State historical/archaeological agency or agencies (cultural resources).

If the sponsor has information that may indicate a need to contact a different agency, then such contact should be made.

In the letter of solicitation, a complete description of the project should be given along with a location map (airport in relation to neighboring community) and a schematic drawing of the project. A response time of 30 days should be given. The agencies should be informed of any previous studies performed at the airport that might be applicable (i.e., archaeological or biological surveys for previous projects).

If no response is received after the 30 day time period, the sponsor may assume that the agency has no concerns with the project and document such in the letter it submits to the FAA with the accompanying checklist. The sponsor's letter of solicitation and its enclosures, the comments

from the responding agencies, and the CE Checklist should then be forwarded as a package to the FAA.

If an agency responds with “no objection,” or by lack of response after the 30 day period, that will generally support the appropriateness of a CE for the project. If an agency responds that it has concerns or that the project “may affect” an environmental resource, that may indicate: (1) the need for additional research or data, for example, a wetlands delineation or archaeological survey; or (2) the need for an EA to be prepared. The responding agency may at times ask for more information. The sponsor should attempt to answer the questions as promptly and accurately as possible. A request for more information does not automatically indicate that an EA is needed. An EA may not be needed unless the agency continues to identify an impact based on the new information.

If you believe you may need to complete a Categorical Exclusion Checklist for your proposed project, please contact Todd Madison, Environmental Program Manager at (816) 329-2640 for any questions concerning the checklist.

#### **Categorical Exclusions Listed in Chapter 6 of FAA Order 5050.4**

The items below **may be categorically excluded** from the requirement for formal environmental assessment, provided they don't trigger any of the **extraordinary circumstances (in FAA Order 5050.4 Chapter 6)**, which create a requirement for EA of actions otherwise excluded. The FAA will use the information provided in the categorical exclusion checklist to determine whether or not extraordinary circumstances exist.

1. Runway, taxiway, apron, or loading ramp construction or repair work including extension, strengthening, reconstruction, resurfacing, marking, grooving, fillets and jet blast facilities, and new heliports on existing airports, except where such action will create environmental impacts off airport property
2. Installation or upgrading of airfield lighting systems, including runway end identification lights, visual approach aids, beacons and electrical distribution systems.
3. Installation of miscellaneous items including segmented circles, wind or landing direction indicators or measuring devices, or fencing.
4. Construction or expansion of passenger handling facilities.
5. Construction, relocation or repair of entrance and service roadway.
6. Grading or removal of obstructions on airport property and erosion control actions with no off-airport impacts.
7. Landscaping generally, and landscaping or construction of physical barriers to diminish impact of airport blast and noise.
8. Projects to carry out noise compatibility programs.
9. Land acquisition and relocation associated with any of the above items.
10. Federal release of airport land.
11. Removal of a displaced threshold.

## RESOURCES

### Forms

- [Categorical Exclusion Checklist](#) (.doc)

### Guidance

- [Central Region Environmental Guidance](#)

## **540 - Airport Site Investigations**

The intent of this guidance is to clarify the required content of Airport Site Studies. This guidance is provided for sponsors and consultants working on establishing new airport sites or seeking inclusion of an existing airport in the National Plan of Integrated Airport Systems (NPIAS).

### **Policy on Site Approval**

Site approval by the FAA is required for all locations as a prerequisite to receiving FAA funding. At locations where a sponsor has previously received site approval based on obsolete standards or where the site was approved for a lower classification such as a VFR, the site study will need to be updated for current standards. The Airport Improvement Program (AIP) Handbook (Order 5100.38) states in Paragraph 428.b. that "...Planning projects that include site selection...normally require a tentative approval of the site before proceeding with subsequent elements." This endorsement should be made after considering:

1. The airspace determination report
2. Site utility
3. Preliminary environmental findings
4. Public hearing testimony
5. Other pertinent factors

### **Site Selection Report Requirements**

The site selection report is to contain detailed information in each of the above areas. A general overview of these requirements is contained in Chapter 9 of FAA Advisory Circular 150/5070-6. The site selection report is to be a narrative report that responds to all factors described in attachment A to this document.

### **Aeronautical Requirements**

First and foremost, any proposed site must be acceptable from an aeronautical perspective. Sites that are not acceptable should not be considered any further in the report. Preliminary screening should be based upon Part 77 requirements, review of topographic maps in relation to topography and obstructions, visits on the ground to the proposed sites, and over flight of the proposed sites by the Flight Procedures Branch of the FAA.

### **Environmental Requirements**

The site selection report is to contain information on potential environmental impacts such as acres impacts to farmland, wetlands, historic properties, 4(f) properties, and forest lands as well as necessary relocations. Such information shall be provided for each of the proposed sites. It should also contain preliminary information about any known or suspected endangered species on any of the proposed sites. This information is preliminary in nature and is used to screen the proposed sites for potential environmental impact. The recommended site will be required to have a detailed environmental assessment after the FAA has given the recommended site tentative approval. The environmental assessment is required and must be approved by the FAA before final FAA approval of the recommended site in accordance with FAA Order 5050.4 and Order 1050.1.

### **Financial Evaluation**

The site selection report is to contain sufficient information to make an informed decision concerning the relative development costs of each of the proposed sites. This requirement is listed in attachment A and includes such items as land costs, utility extension costs, access costs, obstruction removal costs, and construction estimates.

### **Evaluation of sites and Recommendation**

The sites identified need to be evaluated against the above criteria. Once this analysis has occurred, the site list should be narrowed to no more than three sites with one site recommended by the sponsor. This analysis should clearly set forth the reasoning for discarding sites as well as the reasons for recommending the preferred site. If other modes of transportation will be affected, i.e. requiring a road to be closed or relocated, initial discussion with the authority having jurisdiction must be done to determine if the proposed changes will be allowed.

### **Public Involvement**

Public involvement is critical to the successful outcome to the site selection process, and an opportunity for a public hearing is required during the environmental assessment process. Early involvement of the public is essential to determine the public's views on important issues such as safety, environmental impacts, and opinion of potential users of the airport. We strongly suggest a public hearing before recommendation of the preferred site to the FAA.

### **Coordination**

The recommended site must be coordinated with other divisions of the FAA and other units of government (such as the state aeronautics agency, local governments, and highway authorities) before approval can be given. A flight check by the Flight Standards Division will be requested by the Airports Division for the three candidate sites (including the preferred site).

### **Approval of An Airport Site**

The FAA will notify the proponent of a proposed site as to whether the proposed site will receive preliminary approval or disapproval after evaluation of all pertinent information and resulting information from the coordination with other affected agencies.

### **Detailed Site Planning**

The detailed site planning (included in a master plan or ALP report) is not to occur until the site has received preliminary approval by the FAA. The preparation of the final ALP also is not to occur until the site has received preliminary approval. Preliminary site planning will be needed, however, to determine the relative extent of the proposed site that would be impacted by the proposed development. Such preliminary site information would include wind data, a forecast, identification of the critical aircraft, runway dimensions, type of approach needed (precision, non precision, visual), total acreage required, and dimensions of the site needed.

## **RESOURCES**

### **References:**

- Field Formulation of National Plan of Integrated Airport Systems (NPIAS), [Order 5090.3](#)
- Airport Master Plans, [AC 150/5070-6](#)
- State Aeronautics System Plan (Contact your State aviation authority)
- Airport Design, [AC 150/5300-13](#)
- Airport Drainage, [AC 150/5320-5](#)
- Airport Pavement Design and Evaluation [AC 150/5320-6](#)
- Land Acquisition and Relocation Assistance For Airport Development Projects, [Order 5100.37](#) (pdf)
- Airport Environmental Handbook, [Order 5050.4](#)
- Local zoning and land use plans and regulations.

## **541 - Evaluation Factors for Airport Site Investigations**

### **Location**

1. Names, addresses, and business of local parties interested, including any planning and aeronautical organizations.
2. Reason for site investigation - (Statement of Need) including who proposed the airport, is it a local, regional or national need.
3. Conformity with other plans. Is the proposed airport shown in the NPIAS? Is it shown in the state system plan? Is it shown in local planning documents? Does the proposed site conform to the zoning? Do affected local governments agree with the need and the proposed site?
4. Driving time and distance to other airports from the proposed site within 45 miles.
5. Size and type of airport presently required (include critical aircraft and Airport Reference code); ultimate size and type required. (Refer to NPIAS and state system plan).
6. Relationship of airport to area proposed to be served.

Maps including a vicinity map showing locations of candidate site, USGS quadrangle map(s) showing proposed sites, and Aeronautical chart with proposed sites.

### **Airport Site Features**

1. General topographic features of vicinity.
2. Meteorological conditions (Mean Daily Maximum temperature, at least one year of wind data for location).
3. Larger scale drawing of each site including topography. (sheet dimensions are recommended to not exceed 11 " by 17" with a scale of between 1" = 2,000' and 1" = 5,000').

### **Analysis of Each Site**

1. Approximate runway end coordinates and elevations.
2. Section, township, range.
3. Wind rose data.
4. Primary runway approach end.
5. Proposed type of approach to each runway end (Visual, Non precision, Precision).
6. Glide angle available for each approach after obstructions have been cleared.
7. List of obstructions that must be cleared for each runway end.
8. Existing zoning and zoning needed for airport (include name of jurisdiction having zoning authority).
9. Availability of utilities - electricity, gas, telephone, water and sewer.
10. Access road availability and travel time to nearest community.
11. Potential Environmental Impacts

### **Engineering and Construction Factors**

1. General geological features affecting soil and foundation conditions.
2. Types of soil for foundations and drainage.

3. Clearing requirements including fences, trees, etc.
4. Grading factors - light or heavy rock, need to remove adverse materials.
5. Natural drainage courses of site.
6. Drainage improvements needed for airport construction.
7. General pavement design information (i.e. estimates of excavation and fill, sub base volume and thickness, pavement thickness, type and dimensions).
8. Will the airport be lighted?

### **Economic/Financial Feasibility for Each Site**

1. Total estimated development cost.
2. Estimated capital improvement plan including federal and local share of costs.

### **RESOURCES**

#### **Advisory Circulars**

- [AC 150/5070-6](#) - Master Plans
- [AC 150/5300-13](#) - Airport Design

## 550 - Runway Protection Zones

Runway protection zones are a trapezoidal area “off the end of the runway end that serves to enhance the protection of people and property on the ground” in the event an aircraft lands or crashes beyond the runway end. Runway Protection Zones underlie a portion of the approach closest to the airport.

Many people have confused the RPZ with the need for Object Free Areas (OFA), Obstacle Free Zones (OFZ), Object clearing criteria, and Part 77 requirements. Each of these serves distinct purposes and are not all coincident.

While the RPZ also has limitations on obstructions (because it lies below the approach surface and because it includes safety areas and obstacle free areas) the primary purpose of the RPZ is the protection of people and property on the ground.

Under FAA design criteria (which applies to all obligated airports), the airport is required to own the landing area.

Secondly the airport owner is required to have a sufficient interest in the Runway Protection Zones to protect the Runway Protection Zones from **both** obstructions and incompatible land use. Finally the airport owner is required to work to attain compatible zoning around the airport to prevent incompatible land uses that could cause sufficient conflict to endanger the airport and cause it to be closed or require substantial remedial investment to purchase conflicting developed property.

Sufficient interest in the Runway Protection Zones can be accomplished in three primary ways. The first and the preferred method is for the airport to purchase the approach areas in fee. Ownership in fee is preferred because it provides maximum control for the airport. The second is through purchase of an easement (or a combination of easement and zoning). The third alternative is to rely upon adequate zoning which should be enacted even if fee or easement ownership is in place.

FAA Advisory Circular 150/5300-13 states this ownership policy as follows “All ... existing and planned airport elements including the following should be on airport property. (A) Object Free areas, (B) **Runway Protection Zones** (C) Areas under ...Part 77 ... imaginary surfaces out where the surfaces obtain a height of at least 35 feet above the primary surface; and (d) Areas, other than those which can be adequately controlled by zoning, easements, or other means to mitigate potential incompatible uses...Such control includes clearing RPZ areas (and maintaining them clear) of incompatible uses and activities.” Through experience we have learned that it is usually less expensive in the long run to acquire the RPZ in fee rather than acquiring an easement. This is because an easement must be very restrictive in order to provide adequate control unless zoning is also very restrictive.

Compatible land use within the RPZ is generally restricted to such land uses as agricultural, golf course, and similar uses that do not involve congregations of people or construction of buildings or other improvements that may be obstructions. “The following land use criteria apply within the RPZ: (a) While it is desirable to clear all objects from the RPZ, some uses are permitted, provided they do not attract wildlife, are outside the Runway OFA, and do not interfere with navigational aids. Automobile parking facilities, although discouraged, may be permitted, provided the parking facilities and any associated appurtenances, in addition to meeting all of the preceding conditions, are located outside of the object free area extension. **(B) Land uses prohibited from the RPZ are: residences and places of public assembly. (Churches, schools, hospitals, office buildings, shopping centers, and other uses with similar concentrations of persons typify places of public assembly.)**”

In cases where the land is already developed and it would be too expensive to acquire the existing development this policy is a recommendation to the landowner i.e. it is a notice to the landowner that the FAA considers such uses incompatible. "Where it is determined to be impractical for the airport owner to acquire and plan the land uses within the entire RPZ, the RPZ land use standards have recommendation status for that portion of the RPZ not controlled by the airport owner." Where such land is vacant it is rarely impractical to acquire the land in the RPZ. Even if the cost of the land seems to be prohibitive the airport owner is expected to exercise sufficient control through zoning or easements to prevent prohibited land uses.

It is FAA policy to object to incompatible land uses that are proposed for property within the RPZ whether or not the airport owns the land and such objection should be anticipated. In particular when we receive a proposal for an airspace study under Part 157 for the RPZ **we will object when that proposal conflicts with an airport planning or design standard or recommendation.**

We recommend that Airport owners and managers review the Airport Layout Plan for conformity with the above statement. Airports that do not own the entire RPZ should consider the need to acquire such land if there is any possibility that incompatible land uses could occur within the RPZ. In particular easements should be reviewed to ensure that land uses are restricted not just obstructions. Where necessary, requests should be made to the appropriate zoning authority to rezone such land to prevent future incompatible use. Where neither zoning nor easements are adequate the RPZ should be acquired in fee. Airport layout plans should be revised if necessary to show such future land acquisition so that it is eligible under the Airport Improvement Program. An airport can acquire such land and be reimbursed at a later date from a future AIP grant, if funds become available, such land acquisition is shown on an approved ALP, and the FAA determines that such land is eligible.

## RESOURCES

### Advisory Circulars

- [AC 150/5300-13 Airport Design](#)

## 560 - Airport Property Interests

Under FAA design criteria, existing and planned airspace required for safe and efficient aircraft operations must be protected by acquisition or a combination of zoning, easements and other legal means.

The type of control or interest may vary per the type of airport element. Property for landing areas, object free areas, apron areas and terminal areas are generally acquired in fee simple.

For Runway Protection Zones (RPZ), the airport owner shall maintain sufficient interest to offer protection from obstructions and incompatible land use. This may be by fee simple or by adequate restrictive easements. For property surrounding the airport, the airport owner shall strive to implement adequate zoning ordinances that would inhibit incompatible land uses.

The Airport Layout Plan (ALP) typically serves as the primary basis for determining the areas of land necessary for proper protection of the airport and associated airspace. Consideration shall be given both to existing airports limits and planned improvements. From the approved ALP, a determination may be made regarding AIP eligibility in property acquisition expenses.

### RESOURCES

#### Advisory Circulars

- [AC 150/5300-13– Airport Design](#)

## 561 - Avigation Easements

An avigation easement is a conveyance of a specified property interest for a particular area that restricts the use by the owner of the surface and yet assures the owner of the easement the right and privilege of a specific use contained within the easement document. Where it is determined that fee title is not necessary, an avigation easement may be used to secure airspace for airport and runway approach protection and for noise compatibility programs.

Such easement rights may consist of the right-of-flight of aircraft; the right to cause noise, dust, etc.; the right to remove all objects protruding into the airspace together with the right to prohibit future obstructions in the airspace; and the right of ingress/egress on the land to exercise the rights acquired. The easement may also contain any number of additional restrictions as the airport owner deems necessary.

In developing easement language, a sponsor should secure legal counsel and confirmation that the easement is sufficient to provide the intended property rights. A model avigation easement is provided below to assist airport owners in establishing avigation and hazards easements around their airport.

### **MODEL AVIGATION and HAZARD EASEMENT**

**WHEREAS**, ( full name of property owner(s) ), hereinafter called the Grantors, are the owners in fee of that certain parcel of land situated in the City of , County of \_\_\_\_\_, State of \_\_\_\_\_, more particularly described as follows:

*(Insert legal description of property to be covered by easement)*

hereinafter called "Grantors' property", and outlined on the attached map (Exhibit 1);

**NOW, THEREFORE**, in consideration of the sum of dollars (\$ ) and other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the Grantors, for themselves, their heirs, administrators, executors, successors and assigns, do hereby grant, bargain, sell, and convey unto ( owner and operator of airport; i.e., City of ), hereinafter called the Grantee, its successors and assigns, for the use and benefit of the public, an easement and right of way, appurtenant to ( full name of airport ) for the unobstructed use and passage of all types of aircraft (as hereinafter defined), in and through the airspace above Grantors' property above an imaginary plane rising and extending in a generally (i.e., Southerly) direction over Grantors' property, said imaginary plane running from approximately (i.e., 874) feet Mean Sea level above (Point L13) on Exhibit 1 at the rate of one foot vertically for each (i.e. 50) feet horizontally to approximately (i.e., 878) feet Mean Sea level above (Point L11) on Exhibit 1, to an infinite height above said imaginary plane.

Said easement shall be appurtenant to and for the benefit of the real property now known as (name of airport ) including any additions thereto wherever located, hereafter made by ( name of airport owner ) or its successors and assigns, guests, and invitees, including any and all persons, firms, or corporations operating aircraft to or from the airport.

Said easement and burden, together with all things which may be alleged to be

incident to or resulting from the use and enjoyment of said easement, including, but not limited to the right to cause in all airspace above or in the vicinity of the surface of Grantors' property such noise, vibrations, fumes, deposits of dust or other particulate matter, fuel particles (which are incidental to the normal operation of said aircraft), fear, interference with sleep and communication and any and all other effects that may be alleged to be incident to or caused by the operation of aircraft over or in the vicinity of Grantors' property or in landing at or taking off from, or operating at or on said ( full name of airport ) is hereby granted; and Grantors do hereby fully waive, remise, and release any right or cause of action which they may now have or which they may have in the future against Grantee, its successor and assigns, due to such noise, vibrations, fumes, dust, fuel particles and all other effects that may be caused or may have been caused by the operation of aircraft landing at, or taking off from, or operating at or on said ( full name of airport ).

As used herein, the term "aircraft" shall mean any and all types of aircraft, whether now in existence or hereafter manufactured and developed, to include, but not limited to, jet aircraft, propeller driven aircraft, civil aircraft, military aircraft, commercial aircraft, helicopters and all types of aircraft or vehicles now in existence or hereafter developed, regardless of existing or future noise levels, for the purpose of transporting persons or property through the air, by whoever owned or operated.

The easement and right-of-way hereby grants to the Grantee the continuing right to prevent the erection or growth upon Grantors' property of any building, structure, tree, or other object, extending into the airspace above the aforesaid imaginary plane, and to remove from said air space, or at the sole option of the Grantee, as an alternative, to mark and light as obstructions to air navigation, any such building, structure, tree or other objects now upon, or which in the future may be upon Grantors' property, together with the right of ingress to, egress from, and passage over Grantors' property for the above purpose.

***(THE FOLLOWING PROVISION MUST BE INCLUDED IN AN AVIGATION EASEMENT OVER THE RPZ.)***

**THE GRANTORS**, for themselves, their heirs, administrators, executors, successors, and assigns, do hereby agree that for and during the life of said avigation easement, they will not hereafter erect, permit the erection or growth of, or permit or suffer to remain upon Grantors' property any structure in the Runway Protection Zone that is an airport hazard or which might create glare or misleading lights or lead to the construction of residences, fuel handling and storage facilities, or smoke generating activities; and the grantors, for themselves, their heirs, administrators, executors, successors, and assigns, further agree they will not permit places of public assembly upon Grantors' property, such as, churches, schools, office buildings, shopping centers, restaurants, child care facilities, and stadiums.

**AND** for the consideration hereinabove set forth, the Grantors, for themselves, their heirs, administrators, executors, successors, and assigns, do hereby agree that for and during the life of said easement and right of way, they will not hereafter erect, permit the erection or growth of, or permit or suffer to remain upon Grantors' property any building, structure, tree or other object extending into the airspace above the aforesaid imaginary plane, and that they shall not hereafter use or permit or suffer the use of Grantors' property in such a manner as to create electrical interference with radio communication between any installation upon said airport and aircraft, or as to make it difficult for flyers to distinguish between airport lights and others, or to permit any use of the Grantors' land that causes a

discharge of fumes, dust or smoke so as to impair visibility in the vicinity of the airport or as otherwise to endanger the landing, taking off or maneuvering of aircraft. Grantors furthermore waive all damages and claims for damages caused by the removal/elimination of such objects or activities

**TO HAVE AND TO HOLD** said easement and right of way, and all rights appertaining thereto unto the Grantee, its successors, and assigns, until said ( full name of airport ) shall be abandoned and shall cease to be used for public airport purposes.

It being understood and agreed that the aforesaid covenants and agreements shall run with the land and shall be binding upon the heirs, administrators, executors, successors and assigns of the Grantors until said ( full name of airport ) shall be abandoned and cease to be used for public airport purposes.

IN WITNESS WHEREOF, the Grantors (see Footnote) have hereunto set their hands and seals this \_\_\_\_\_ day of \_\_\_\_\_, 19\_\_\_\_.

\_\_\_\_\_  
(SEAL)

Grantor(s)

**ACKNOWLEDGMENT**

**STATE OF** \_\_\_\_\_,

**COUNTY OF** \_\_\_\_\_

**BE IT REMEMBERED**, that on this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_, before me, the undersigned, a Notary Public in and for the County and State aforesaid, came \_\_\_\_\_, who are personally known to me to be the same persons who executed the within instrument of writing and such persons duly acknowledged the execution of the same.

**IN WITNESS WHEREOF**, I have hereunto set my hand and affixed my seal, the day and year last above written.

\_\_\_\_\_  
Notary Public

My commission expires \_\_\_\_\_

**Footnotes:**

Local recordation and subordination practices must also be met. If subordination is necessary, in which case the mortgagee must join in the agreement, the following language is suggested:

In consideration of the premises and to assure Grantee of the continued benefits accorded it under this easement, ( name of mortgagee ), owner and holder of a mortgage dated \_\_\_\_\_ and recorded \_\_\_\_\_ covering the premises above described, does hereby covenant and agree that said mortgage shall be subject to and subordinate

to this Easement and the recording of this Easement shall have preference and precedence and shall be superior and prior in lien to said mortgage irrespective of the date of the making or recording of said mortgage instrument.

## RESOURCES

### Advisory Circulars

- [AC 150/5100-17](#) - Land Acquisition
- [AC 150/5300-13](#) - Airport Design

## 562 - Zoning Around Airports

When an airport sponsor (owner) accepts an AIP grant the sponsor agrees to the following condition (assurance) as a condition in accepting that grant.

*Compatible land Use: It (the airport owner) will take appropriate action, including the adoption of zoning laws, to the extent reasonable, to restrict the use of land adjacent to or in the immediate vicinity of the airport to activities and purposes compatible with normal airport operations, including landing and takeoff of aircraft. In addition, if the project is for noise compatibility program implementation, it will not cause or permit any change in land use, within its jurisdiction, that will reduce its compatibility, with respect to the airport, of the noise compatibility measures upon which federal funds have been expended.*

The objective of zoning land on and around the airport is to assure that future uses of the land are compatible with airport operations to protect and preserve the airport and the public investment in the airport.

Zoning objectives are to prevent the following incompatible uses:

- Residential and other noise sensitive uses.
- Congregations of people in approach and departure areas to protect people and property on the ground.
- Man made and natural structures that can interfere with flight.
- Uses which may be affected by vibration or fumes from aircraft operations.
- Uses of land on the airport that interfere with areas needed for aviation related activities.

Proper zoning of land on and around the airport can prevent the need to acquire land in fee or easement to protect the airport. (As zoning law is individual to each state the state statutes must be referred to, to determine the extent of zoning authority.) However, typical state aeronautical statutes generally provide greater zoning latitude for airports. You may need to consult an attorney for a legal determination of the zoning authority available in the jurisdiction of your airport may be necessary.

The first step in airport zoning is to develop a current Airport Layout Plan (ALP) for your airport. The ALP depicts land that the airport should own in fee as well as land for which easements may be necessary. The airspace drawings show obstructions to navigation and indicate areas that may need to be regulated in order to prevent or remove such obstructions. The Part 77 imaginary surfaces should be protected through height limitations on development both on and around the airport and especially in the approach areas and departure areas of the runways. The FAA has developed Advisory Circular AC 150/5190-4 "A Model Zoning Ordinance to Limit the Height of Objects Around Airports" for this purpose.

The ALP may be adopted by reference and used to limit the height of objects that would interfere with airport usage. Such adoption needs to be coordinated with local zoning authorities such as the city or county of jurisdiction. Close coordination with the county or city planning departments is essential for successful implementation of airport zoning.

Zoning solely to limit the height of objects around the airport will not be sufficient to prevent the construction of incompatible uses such as housing or uses that attract congregations of people in the approach areas. To control these types of uses, exclusionary zoning is necessary to prevent incompatible uses from occurring. We have also developed guidance on what uses are considered to be incompatible with airports. This guidance is contained in the Advisory Circular AC 150/5020-1 "Noise Control and Compatibility Planning for Airports".

The airport owner has an obligation (due to the grant assurance) to request that the zoning authority enact zoning restricts sufficient to protect the airport. Where the zoning authority and the airport owner are the same it is reasonable to expect that the jurisdiction will enact the appropriate zoning. Good faith efforts to enact appropriate zoning should include a written request from the airport owner to the zoning authority.

Where the zoning authority refuses to enact appropriate zoning to protect the airport, the airport authority must be prepared to acquire the necessary control of land, especially in the approach areas, to ensure right of flight. Such acquisition is clearly more expensive than appropriate zoning. Failure to properly zone property creates the potential for conflicts with adjacent land uses that not only can cause expensive legal fees but can also endanger the public and users of the airport. The FAA encourages appropriate zoning and planning to prevent encroachment by incompatible uses around the airport that can ultimately cause an airport to close.

Various States and other public organizations have developed and implemented model airport zoning ordinances. Airport owner/operators may consider referring to these models as development guide for creating their own zoning ordinance.

## RESOURCES

### Advisory Circulars

- [AC 150/5190-4](#) - Zoning Ordinances
- [AC 150/5300-13](#) - Airport Design

## **563 - Release of Airport Property**

Any release, modification, reformation or amendment of an airport agreement between the owner and the United States must be based on a request made in writing, and signed by a duly authorized official of the public agency that owns the airport.

### **Required Documentation**

Although no special form is required, an owner's request should be specific, as applicable and known. Please include one copy of the following in your request:

- a. What is requested?
- b. What agreement(s) with the United States are involved?
- c. Why the release, modification, reformation or amendment is requested.
- d. What facts and circumstances justify the request?
- e. What requirements of state or local law or ordinance should be provided for in the language of a FAA issued document if the request is consented to or granted.
- f. What property or facilities are involved?
- g. How the property was acquired or obtained by the airport owner.
- h. What are the present condition and what present use is made of any property or facilities involved?
- i. What use or disposition will be made of the property or facilities?
- j. What is the appraised fair market value of the property or facilities? Appraisals or other evidence required to establish fair market value.
- k. What proceeds are expected from the use or disposition of the property and what will be done with any net revenues derived.
- l. A comparison of the relative advantage or benefit to the airport from sale or other disposition as opposed to retention for rental income.

### **Exhibits to Accompany Request**

Each request should have a scaled drawing attached showing all airport property and airport facilities which are currently obligated for airport purposes by agreements with the United States. Other exhibits supporting or justifying the request, such as maps, photographs, plans and appraisal reports, should be attached, as appropriate.

### **Airport Layout Plan**

A revised Airport Layout Plan (ALP) must be prepared which reflects the changes to land areas and airport facilities attendant to this action. Accompanying this drawing(s) should be a brief narrative which outlines the rationale used in arriving at the revised plan, i.e., crosswind coverage with only the N/S and NW/SE runways, taxiing patterns to be established, how clearance lines were established, and what kind of aircraft and numbers of operations were assumed in preparing the plan.

### **Release of Maintenance Obligations**

Requests for the release of maintenance obligations do not require items i., j., and k. as noted above.

### **Questions**

Questions pertaining to a Sponsor's request for release of airport property within the FAA Central Region should be directed to Nicoletta Oliver at (816) 329-2642.

## 570 - Apron Design

The basic design of airport aprons is controlled by FAA standards, effective design considerations and eligibility criteria.

The primary considerations for apron design are

- Apron Type (*Terminal, Transient, Fueling, Based Aircraft and Holding*)
- Tie down Layout
- Based Aircraft
- Itinerant Aircraft

Other Considerations include the following:

- Spacing of tiedowns need to match size of AC that utilize airport
- Wind orientation, tie downs into wind when possible
- Design Group considerations

## APRON DESIGN ELEMENTS

### Taxiway

- A defined path established for the taxiing of aircraft from one part of airport to another.
- Assume a design speed of 20 mph

### Taxilane

- Portion of the aircraft parking area used for access between taxiways and aircraft parking positions
- Lower speeds allow for reduced safety area and object free areas
- Taxilanes are located outside of the movement area
- Best practice is to locate taxilanes on edge of apron

### Taxiway/Taxilane Object Free Area

- An area on the ground centered on the taxiway and taxilane that is provided to enhance the safety of aircraft operations by limited objects not fixed by function (e.g. taxiway lights)
- OFA Restrictions include service vehicle roads, parked aircraft, above ground objects not fixed by function.
- Vehicles may operate within an object free area but must yield to operating aircraft.

## APRON DESIGN

### Locating Taxiways and Taxilanes

- Use ultimate separation standards (See tables in Chapter 2 of AC 150/5300-13)
- Leave room for potential growth of apron
- Provide access to apron, FBO and Hangars

- Aircraft parking areas shall be located outside of taxiway and taxilane object free areas

#### **Dimensional Standards**

- Refer to tables in Chapter 4 of AC 150/5300-13 for FAA standards on pavement width, safety area width and object free area width.

### **GRADE STANDARDS**

#### **Maximum Grade for Aprons**

- For aircraft categories A and B maximum grade is 2%
- For aircraft categories C & D, maximum grade is 1%

#### **Maximum Longitudinal Grade For Taxiways**

- For aircraft categories A and B maximum longitudinal grade is 2%
- For aircraft categories C & D, maximum longitudinal grade is 1.5%

#### **Grade Changes for Taxiways**

- The maximum permissible change in grade is 3%
- A vertical curve shall be incorporated between changes. The length of vertical curve shall be 100' for each 1% change in grade

### **HANGAR CONSIDERATIONS**

#### **Layout of Hangars**

- Best use of space is perpendicular to runway or parallel to runway.
- Separate locations for corporate hangars and T-hangars.
- Provide for potential expansion of hangars
- Avoid orientation that results in a north facing hangar door.
- Locate T-hangars away from the general apron area.
- Locate corporate hangars close to the general apron area

### **AIP ELIGIBILITY OF APRONS**

#### **Eligible Areas**

- FAA Order 5100.38 states "The construction, alteration, and reconstruction of public use apron areas are eligible".
- Predominantly exclusive use not eligible.
- Eligibility of Taxiways and Taxilanes follow the same criteria as that of aprons, they must be public use pavements.

#### **Ineligible Areas and Items**

- Exclusive use areas - Private use areas, no services for general public
- Pavement within the limits from the edge of the object free area to the face of a structure or object. Typically 20 to 25 feet from face of structure.

- Private use structures such as aircraft manufacturer structures.

## Size Considerations for AIP Apron

### Apron for Transient Aircraft

- Parking area sized for 50% of busy day itinerant aircraft
- Busy day = 10% more than average day in busiest month
- Allow 360 square yards per aircraft
- Allow 10% for growth
- Provide accommodations for different size aircraft.

### Apron for Based Aircraft

- Allow 300 square yards per based aircraft
- Tailored to meet needs of specific based aircraft

## MARKING OF APRON

- Taxiway/Taxilane centerline must protect the object free area of the class of aircraft taxiing on the centerline.
- Parked aircraft and other objects shall not present a wing tip conflict for taxiing aircraft.
- Recommend spacing of tiedowns per the recommendations of AC 20-35 "*Tiedown Sense*". Generally the spacing shall be at least the wingspan + 10'. Tighter spacing may require wingwalkers be present for parking aircraft.

## RESOURCES

### Advisory Circulars

- [AC 150/5300-13](#) - Airport Design
- [AC 150/5360-13](#) - Terminal Facilities
- [AC 150/2530-4](#) - Fueling Facilities
- [AC 20-35](#) - Tiedown Sense

## 580 - Planning Resources

This page presents various available planning resources for the benefit of Sponsors and planning consultants. Additional guidance may be available from the appropriate FAA planner.

### Advisory Circulars

#### [Airport Planning Advisory Circulars](#)

- Listing of Advisory Circulars relevant to airport planning.

#### [Agricultural Leases AC 150/5200-33 “Hazardous Wildlife Attractants on or near Airports”](#)

- Provides guidance on agricultural leases including guidelines for crop restriction lines.

#### [Design Standards](#)

- A quick reference to design standards for various airport related equipment, facilities and structures.

#### [Master Planning Guide - Advisory Circular 150/5070-6](#)

- Provides FAA guidance for the preparation of airport master plans, pursuant to the provisions of the Airport and Airway Improvement Act of 1982.

### Publications, Reports and Documents

#### [ALP Checklist](#)

- A regional tool to assist airport planners in preparing airport layout plans in accordance with FAA requirements. Checklist available in MS Word format

#### [Aviation Forecasts](#)

- Access various forecasts and trend analysis documents made available by the Office of Aviation Policy and Plans (APO)
  - Current FAA aviation forecast.
  - Long Range Forecasts
  - Terminal Area Forecast (TAF)

#### [Passenger & Cargo Data](#)

- Access enplanement and cargo data that is extracted from the Air Carrier Activity Information System

#### [Aeronautical Survey/GIS Program](#)

- The website portal for submitting aeronautical survey and airport GIS data. This site also has sample Scope of Work documents as well as general information on how to gather and transmit survey data to NGS and the FAA.

#### [Unpaved \(Turf\) Runways](#)

- Information on turf runway dimension/design standards in the form of a briefing presented at the Central Region Airports Conference in 1997.

**Software Applications****[Apron Area Calculator](#)**

- A MS Excel spreadsheet for sizing of aprons for itinerant aircraft.

**[Snow Plow Calculator](#)**

- A MS Excel spreadsheet for sizing of rotary plow capacity and snow plow blade length.

**[Geodetic Toolkit](#)**

Applications provided by [National Geodetic Survey](#) to calculate geodetic positions and to determine magnetic declinations